

What's Growing On



University of California

Agriculture and Natural Resources | Master Gardener Program

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Internal Master Gardener Newsletter

April-June 2018

Year End Summary!

Our volunteer year is coming to an end and once again I am blown away by the enthusiasm and excitement our Master Gardeners bring to events and outreach we participate in. Since July 2007, we have just over 52,420 volunteer hours and 14,550 CEU hours. In 2017-2018, Master Gardeners volunteered 6,025 hours and earned just over 1,000 CEU's. The national estimated value of volunteer hours is \$24.69 an hour. That brings the value of your volunteer time since 2007 to \$1,294,249 and \$148,757 in the last year! Those are some amazing numbers to be proud of!

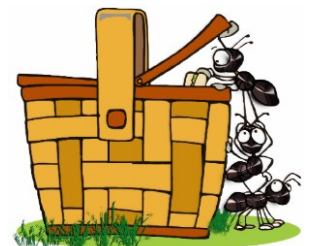
We just received our first Quarterly Program Evaluation from September-December 2017. These reports are provided by the Statewide Master Gardener Office. The information is collected from the surveys that are sent out after our public workshops. We submitted information for 4 classes within those months and its exciting to see the information that came in. The data will only continue to grow as we continue workshops and public events and attendees get accustomed to the surveys and the value they bring to the program. I will be posting the reports on our Master Gardener only website. You can find the September-December report by [clicking here](#). Keep in mind, the surveys are sent out 3 months after the workshop. This gives our attendees to put into practice things they learned at our classes.

Keep up the excellent work!



July is our Summer Party & Awards Dinner

Don't forget that July is our summer party and awards dinner. The hospitality committee has been working on some fun activities for this evening. I will be ordering sausages from Lockeford Meats and need someone that is willing to bring a BBQ to heat up the sausages before our meeting. If you are willing to help out with this task, please let me know ASAP. We will also be issuing our annual awards at this monthly meeting so mark your calendar for Wednesday July 18th! Guest are welcome to come, there will be a nominal fee to help cover food.





Top picture: What a human eye would see.
Bottom picture: What a bee would see



What's Wrong?

What is this growing on my mulched flower bed? You can find the answer on page 13.

Bee-hold! The Eyes of a Bee!

Did you know that bees have two different types of eyes-each with separate functions.

The three smaller eyes in the center-top of a bee's head are called ocelli. Ocelli comes from the Latin word "ocellus" which means little eye. These little bee eyes have single lenses and help the bee maintain stability and navigate. They enable the bee to judge light intensity and stay oriented.



Every bee has 2 compound eyes. A compound eye is made up of thousands of tiny lenses called facets. Each of these facets takes in one small part of the insect's vision. The bee's brain then converts these signals into a mosaic-like picture made of each image. Worker bees have 6,900 facets in each eye, and drones have 8,600 facets.

Bees also see ultraviolet (UV) light which is not normally visible to humans. This comes in handy when searching for food: Special pigments in flowers can absorb or reflect UV light, revealing a "landing strip" that guides the bee to a plant's store of nectar and pollen. Their eyes are more sensitive to blue and purple since bees can't see the color red.

Bees also have the ability to see color much faster than humans. Their color vision is the fastest in the animal world-five times faster than humans. Bees see up to 300 pictures per second – while we humans can only manage up to 65. For more information, [click here](#). Information for this article was taken from Bee Culture Magazine.

How Do I...

How do I find the Master Gardener Contact Book?

If you are signed up for an event and don't recognize the name, you may be wondering who exactly you are working with. Maybe you want to email a volunteer to get their recipe for a monthly meeting dessert you thought was out of this world. There are a lot of volunteers to keep track of and placing a face to a name doesn't always come easy. The Master Gardener contact book comes in handy for these types of situations. It contains a photo along with the basic contact info of all the active Master Gardeners in our program. This PDF document can be found on the Master Gardener only section of our public website. Just go to our homepage (<http://ucanr.edu.sjmg>) and then over on the left click on the *Master Gardener Page—For Volunteers Only*. Scroll down a bit and you will see the Directory right in the middle of your screen. Since it's a PDF you can save it to your computer to make accessing it that much easier.



Did you know... You can hover your mouse over anything that is blue and underlined and by clicking on it you will be directed to a webpage with more information about that subject! Try it!!



CA Firewood Task Force

The California Firewood Task Force came about through a resolution passed by the California Forest Pest Council in November 2010.

Resource management professionals and scientists recognize that transport of firewood is one of the principal means by which many invasive pests are spread from one area to another.

The Pest Council resolution highlighted this threat and called for the formation of a California-wide task force to address the issue.

New!!! Vegetable Pest Identification for Gardens and Small Farms

Based on the bestselling *Pests of the Garden and Small Farm* these handy cards will put the answers to your pest problems in the palm of your hand.

Use this spiral bound set of 53 pock-sized cards in the field to identify and manage common pests of vegetables grown in backyards; community or school gardens; and small, diversified farms in urban or rural areas.

Included are cards on general predators, lady beetles, parasites, and insect pathogens to help you identify the natural enemies that can reduce the numbers of insect and mite pests.

The pest cards cover the most common insect and mite pests as well as pathogens such as fungi, bacteria, and viruses that cause plant disease. Also covered is general information on nem-

atodes, abiotic disorders (caused by nonliving factors), weeds, and vertebrate pests.

Brief outlines of management practices are provided in the "What To Do" section of each description.

From aphids to late blight, squash and stink bugs to spotted spurge, these cards have you covered!

The focus is on sustainable pest management methods that prevent pest problems and protect people and the environment. The best strategy is an integrated pest management (IPM) program that relies on a combination of multiple techniques or tools including the use of natural enemies of pests, using traps and barriers, and preventive cultural practices such as irrigation methods, soil management, pruning techniques, and garden sani-



tation. Almost all the pest management techniques suggested are organically acceptable.

Due to staffing issues, ANR Catalog will no longer be able to support individual volunteer orders using your discount. You will be able to purchase from our office with the 40% discount. I will let you know when we have this one in stock.

Cool Tools: Firewood Scout



School is out and summer camping trips are being planned. One thing that is often packed that people don't think twice about is firewood. Our forests are threatened by nonnative insects and diseases. Many of these pests can be transported long distances on firewood. Once transported to new areas, these invasive species can become established and kill large numbers of trees and shrubs.

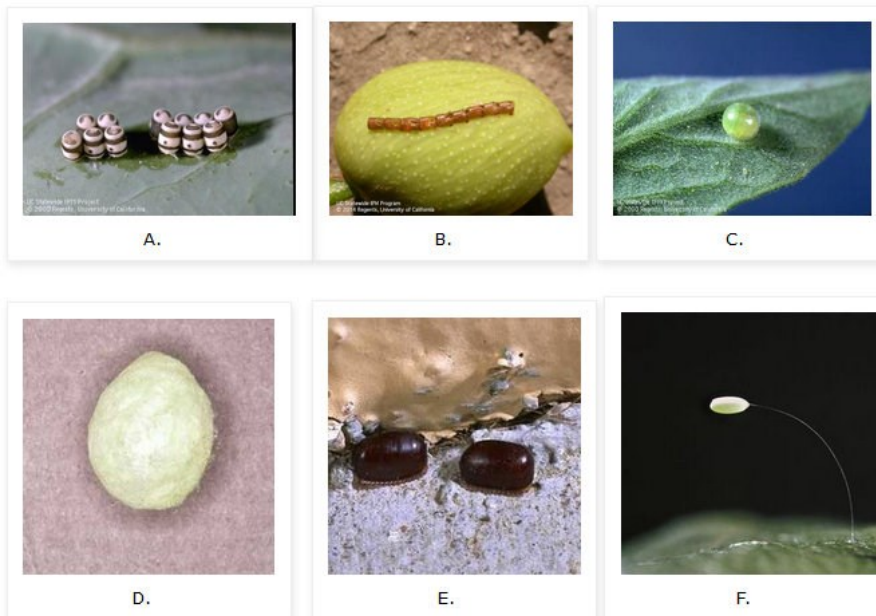
Firewood Scout is a web-based map that will help you find firewood dealers near the location where you will be using firewood. The website offers information on invasive species of concern in California as well as a set of questions consumers can ask to help assure the wood being purchased is low-risk for insects and diseases. [Click here](#) to find firewood dealers near your summer camping site.

Who Do These Eggs Belong To? UC IPM

Easter may have already passed but there are still eggs already hiding in your yard: insect and spider eggs!

Many insects and spiders have strangely shaped and colorful eggs that you may have never noticed. Below are some photos of these interesting eggs and our own version of a spring time egg hunt.

We challenge you to guess which adult insect or spider belongs to the following eggs and egg cases. Some are beneficials, while others might be pests. Extra “points” awarded for being able to know the difference! You can find the answers on [page 11](#). To view the rest of the eggs and answers featured in this Blog, [click here](#).



Amazon Fined For Selling Illegal Pesticides



Online marketplace Amazon.com was recently fined \$1.2 million by the United States Environmental Protection Agency (US EPA) for selling and distributing pesticides not registered for sale in the U.S. The EPA discovered nearly 4,000 violations dating back to 2013. The illegal products included misbranded or unregistered insecticide baits and pesticide products that can be mistaken for blackboard chalk.

Amazon immediately removed these illegal products from their marketplace, prohibited foreign sellers from selling pesticides, and increased monitoring for illegal products. The company contacted the affected customers to urge proper disposal of the illegal pesticides and reimbursed them for the purchases.

As part of an agreement with EPA, Amazon has agreed to continue closely monitoring illegal pesticides and removing them from its website. The company will also develop an online training course for the general public and online marketers on pesticide regulations and policies. The course will be available in English, Spanish, and Chinese. [Article from UC IPM Blog](#)

Curling Leaves on Plants

If you are puzzled by curling leaves on plants in your garden or landscape, you may need to do some detective work to figure out the cause. Curling leaves can be caused by many problems, including insect damage, disease, abiotic disorders, or even herbicides.

Insects: There are several insect pests that cause leaves to curl when they suck plant juices of new or young leaves that are still growing. These include [aphids](#), [thrips](#), and [whiteflies](#).

Peach leaf curl: If you have peach or nectarine trees and see curled, reddish, puckered leaves, your tree likely has a disease called [peach leaf curl](#). This plant fungus affects only peach and nectarine trees.

Abiotic damage: [Leaf rolling](#) in vegetable plants like pepper, eggplant, and tomato is very common during wet spring conditions. This isn't caused by a disease, and no action is necessary.

Herbicides: When spraying for weeds, [herbicides](#) (weed killers) can accidentally drift onto or come in contact with desirable plants, causing damage. Herbicides containing active ingredients such as glyphosate and 2,4-D can cause leaves to curl.

Determining the Cause: For further help in finding out what is causing leaf curling on your plant, use the UC IPM [plant problem diagnostic tool](#). This easy-to-use tool contains useful photos and will help narrow down and diagnose the problem.

Check out the UC IPM Pests in the Urban Landscape Blog! The blog provides a one-stop site for UC IPM news related to pests of homes, gardens, landscapes, and structures. We post articles from our newsletters as well as announce new and revised Pest Notes and other new educational materials or activities of interest to urban and residential audiences.



This article was featured on the UC Urban Pest Management Blog on May 21, 2018.

The screenshot shows the UC IPM Plant problem diagnostic tool interface. At the top, there is a navigation bar with the UC IPM logo and a breadcrumb trail: UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool. Below the navigation bar, the title "Plant problem diagnostic tool" is displayed with a help icon. The main content area is divided into two columns. The left column has a "Plant Types" dropdown menu with three options: "Plant Names", "Plant Parts", and "Damage". Below these options is a text input field labeled "Select plant types for list of results" and a "Reset All" button at the bottom. The right column is titled "Select plant types" and contains four image-based selection options, each with an "Add to my list" button and a magnifying glass icon. The options are: "Flowers" (with a photo of pink flowers), "Fruit trees, nuts, berries, and grapevines" (with a photo of oranges), "Trees and shrubs" (with a photo of a tree), and "Vegetables and melons" (with a photo of cherry tomatoes).



Do you have CE events to share?

Many of you subscribe to local nursery or garden club newsletters that may have possible CE opportunities for Master Gardeners. If you run across something that you think might count as CE, please send it to me so I can review the event. If it applies to our program, I will post it and share it with our group.



Growing Insectary Plants

You can help natural enemies by growing insectary plants.

Natural enemies, also called beneficials or biological control agents, include lady beetles (ladybugs), lacewings, spiders, parasitic wasps, and even some mites! These natural enemies feed on pests in the garden and landscape and may reduce the need for insecticides. Protect natural enemies by avoiding the use of pesticides that kill them and keeping ants out of pest-infested plants.

Insectary plants provide nectar, pollen, and shelter throughout the year for natural enemies. In order to provide a year-round source of food for them,



choose plant species and cultivars that flower at different times and are well-adapted to your area. Here are a few that you may already be growing in your garden or landscape:

- Sweet alyssum
- Western redbud
- Flannel bush
- Toyon
- Milkweed
- California poppy

Visit UC IPM's [Insectary Plants web page](#) to learn more about the benefits of planting insectaries around the garden and to see a longer list of insectary plant species.



Helpful Websites

[Master Gardener VMS Help and Users Guide](#)

While the UC Master Gardener Program has been around since the 1980s, thankfully our technology has changed with the times. Most recently, the Volunteer Management System (VMS) received its long overdue upgrade – we've launched version 3.1!

If you have any questions about the new sys-

tem, help is only a click away. Check out our VMS help page, which includes a new VMS User's Guide and How-To videos for commonly used functions. See for yourself at: ucanr.edu/sites/vmshelp



Volunteer Management System (VMS)^{3.1} User's Guide

Heat Illness Awareness & Precautions

According to the National Weather Service, an average of 235 heat-related fatalities occurred annually between 1975 and 2004. Moreover, about 25,000 heat-related illnesses or injuries occurred from 1991-2000. By taking several simple precautions, people can control and/or reduce exposure to conditions that may cause heat illness.

Heat Illness Disorders and Symptoms

1. Heat Stroke - sweating stops and the body fails to regulate its temperature. Victims may die if they don't receive immediate medical treatment. Characterized by: mental confusion, fainting, or seizures; hot dry skin usually reddish in color; and high body temperature.
2. Heat Exhaustion - profuse sweating results in dehydration. Characterized by: fatigue, dizziness, and nausea; pale and moist skin; and possibly slightly elevated temperature.
3. Heat Cramps - cramping thought to be due to loss of salt through sweating. Characterized by muscle spasms in arms, legs, and abdomen during or following physical activities.
4. Heat Syncope - dehydration while standing still causes blood pooling in lower portions of the body. Characterized by fainting while standing still.
5. Heat Rash - occurs under hot and humid conditions where sweat does not evaporate readily. Characterized by irritated/itchy skin with prickly feeling and small red bumps on skin.



Treatments for Heat Illness Disorders

1. Heat Stroke - call 911 immediately, soak victim's clothing with cool water, move victim to shaded and cool area, fan victim to increase cooling of their body.
2. Heat Exhaustion - have victim rest in shaded and cool place and drink fluids. Do not serve caffeinated fluids such as soft drinks, iced tea, or coffee.
3. Heat Cramps - have victim rest and drink non-caffeinated fluids.
4. Heat Syncope - have victim rest in a shaded and cool place, and drink non-caffeinated fluids.
5. Heat Rash - wash and dry skin. Wear loose clothing and keep skin dry.

Precautions to Prevent Heat Illness Disorders

1. Master gardeners and others should acclimatize themselves to the prevailing weather conditions.
2. Always drink plenty of fluids such as water and sports drinks. During warm weather, plan to have at least one quart of water available per person per hour of the outdoor activity. Avoid caffeinated drinks.
3. Wear a summer hat with a brim and loose-fitting, light-colored, and lightweight clothing like cotton.
4. Schedule vigorous activities during coolest portions of the day and take frequent breaks on hot days.
5. If someone is feeling symptoms of heat illness, they should take a rest period in a shaded area. Master gardeners should help find access to shade – this may be any area where the affected person is protected from direct sunlight, such as under an umbrella, a portable structure, or inside a ventilated building or vehicle.

Landscape Tree Damage: Its Not Always a Pest Issue Janet Hartin

[From the Spring issue of the UC IPM [Retail Nursery & Garden Center News](#)]

Most disorders impacting landscape trees result from abiotic (non-living) disorders rather than attacks from biotic (living) pests like plant pathogens, insects, and vertebrates. Damage caused by abiotic and biotic disorders can appear similar, making diagnosis difficult at times. For example, discolored leaves on a *Ficus nitida* tree could be due to drought stress, a fungus, or a nutrient toxicity or deficiency.

In some cases, biotic injury may be obvious and abiotic disorders can be ruled out. For instance, many insects and diseases are often restricted to a single plant species and will not affect multiple plant species in the area.

To determine if damage is the result of an abiotic disorder, look at the landscape as a whole. Are symptoms exhibited by a single plant species or by a wide array of species? Usually, uniform damage to multiple species within a limited area of the landscape signifies one or more abiotic factors are to blame.

Below are several common landscape disorders encountered around home landscapes and ways to prevent them or remedy problems once they occur.

Too Little or Too Much Water

Providing inadequate water can adversely impact plants until they are established, even drought resistant species. Outbreaks of insect pests, such as certain bark beetles, can quickly infest stressed, water-deficient trees. Because drought-stressed trees cannot recover from wounds as quickly as healthy trees, pathogens causing several canker diseases are often common during and just after drought.



[Fig 2. Mechanical injury to the trunk of a young tree. A planting stake tie was attached too tightly and left on too long, girdling the trunk. \(Photo: L. R. Costello,](#)



[Fig 1. Limb dieback and sparse canopy of overwatered olive trees around which turf was planted. Unirrigated trees in the background are healthy. \(Photo: L. R. Costello, UCCE\)](#)

However, many established landscape plants suffer from too much water rather than not enough water (Figure 1). As woody plants age, they prefer to be irrigated more deeply and less often than when initially planted.

Heat Stress

Heat stress often occurs when a tree is planted in a climate zone with higher summer temperatures than those to which the tree is adapted. Over time, high air and soil temperatures can lead to irreversible damage. In some cases, trees well adapted to inland or desert climates can become stressed and die under temperatures they would normally endure if a water deficit develops.

Landscape Tree Damage (continued)

You can access the American Horticultural Society (AHS) [heat zone map](#) information (based on the number of days with temperatures above 86°F) to find the heat zone in your area. Many nurseries now include this information on plant tags.

Mechanical Injury

Mechanical injury, like damage from tight, unremoved staking ties (Figure 2), can extend into the vascular system of plants, cutting off the flow of water and nutrients. Early symptoms include wilting, stunting, and general decline. Bark can also be damaged from mowers and weed trimmers. Advise customers to avoid trunk injury since damaged bark cannot be repaired.

Salt Build-up from Overfertilization or Recycled Water

Excessive applications of fertilizers and irrigation with water high in certain ions can result in salt toxicity. Damage appears as marginal leaf browning, leaf scorch, stunting, or chlorosis (Figure 3). Another visual sign of salt build-up is the presence of a white or black crust on the soil surface. Salt damage can result in injury and even death, of sensitive plants. Trees do not require nutrients immediately after transplanting because they store food reserves in roots.

With landscapes increasingly being irrigated with recycled water, leaching needs to be a routine component of maintenance. Saline soils can be remedied by leaching salts below the root zone with large amounts of fresh water (the original source of saline water cannot be used for this). In some cases, when the irrigation water is more saline than most plants will tolerate, less sensitive species should be selected.

Prevent abiotic disorders by selecting healthy plants well suited to the climate and microclimate, incorporating recommended planting techniques, providing a soil environment that optimizes healthy root systems, and implementing sound cultural management practices (such as irrigation, fertilization, pruning, and aeration).

This article was modified from a previously published article from the Winter 2017 issue of UC IPM's [Green Bulletin \(Vol. 7, No. 2\)](#). For more comprehensive information about abiotic issues, refer to the UC ANR publication, [Abiotic Disorders of Landscape Plants: A Diagnostic Guide](#).



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[Fig 3. Chlorotic leaves with necrotic margins and tips, especially severe on older foliage of European hackberry, due to root exposure to excess salinity. \(Photo: Hortscience, Inc.\)](#)

A Little Bit About Mosquitos

Information from the San Joaquin Mosquito & Vector Control



Did You Know

Only females bite to get blood from mammals, birds, amphibians, and reptiles using specialized mouthparts (proboscis).

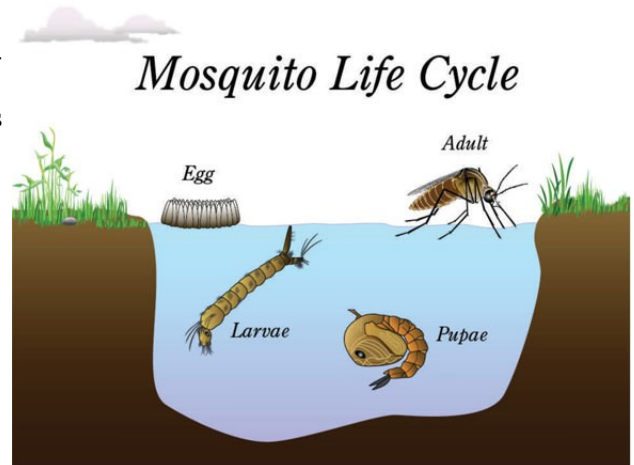
Proteins in blood are needed to produce eggs.

San Joaquin County has seventeen types of common mosquitoes. [Click here](#) to read more about them.

Many electronic devices claim to repel mosquitoes with high frequency sounds that mimic their natural predators; however there is no scientific support for these claims.

Biology

Mosquitoes complete a full metamorphosis: egg, larva, pupa, and adult. Critical to the mosquito's life cycle is water. Egg rafts are laid on still or standing water. Each raft contains 100 - 300 eggs. The eggs hatch to larvae. The larvae grow through 4 instars, shedding their outer skin as they grow to the next stage. Once the larvae reach the 4th stage (or instar), they then transform to pupae. The pupal stage is the equivalent of the cocoon, where the adult insect body develops. Once development is complete, the pupae hatch off the water as adult mosquitoes. The adult female then needs to take a "blood meal" to provide necessary nutrients to her eggs. In warmer weather, mosquitoes complete a full metamorphosis, on average, in seven to ten days.



Control

Biological mosquito control methods are one of the mainstays in protecting the public from mosquitoes and the transmission of mosquito-borne diseases. Mosquito biological control agents include a wide variety of pathogens, parasites and predators. The primary biological control agent used by the District is *Gambusia affinis*, the mosquitofish. Mosquitofish are small live-bearing minnows closely related to the common guppy. Used in mosquito control in California since 1922, these fish are vivacious consumers of mosquito larvae and pupae and can survive in varying water conditions. Because mosquitofish are surface feeders, they are extremely efficient mosquito predators. Mosquitofish have been said to consume upwards of 80-100 mosquito larvae per day, and are capable of quickly populating a source if conditions are favorable. You can get mosquito fish for free. For more information, [click here](#).



Physical control, also known as source reduction or habitat modification, is another form of control utilized in the District's IPM plan. This can be as simple as properly discarding old containers which hold water or as complex as developing a regional drain system for storm water. Physical control is important in that its use can virtually eliminate the need for pesticide use in and adjacent to the affected habitat.

Chemical control is also used. You can read more about that, [here](#).

For more information, visit the [San Joaquin County Mosquito Vector Control website](#). They have also created a very informative handout that [can be found here](#).

Who Do These Eggs Belong To Answers

- A. [Harlequin bugs](#) are colorful insect pests that cause damage when they suck fluids from plant tissue. Heavy infestations may cause plants to wilt, turn brown and die. Their eggs are drum-shaped and often brightly colored.
- B. [Leaffooted bugs](#) are odd-looking insect pests with piercing-sucking mouthparts. Their feeding produces destructive damage on the fruit or plants they attach. Eggs of leaffooted bugs are brown, cylindrical, and laid end-to-end in a string-like strand.
- C. [Tomato hornworm](#) moths are large, sometimes with a wingspan of up to 5 inches! The larva or caterpillar of this pest is well-known and causes damage to plants, while adult moths do not. Hornworm eggs are laid singly on leaves and are not easy to see.
- D. Female [black widow spiders](#) are feared by many people since they are poisonous and may bite. However, these shy spiders prefer to hide in holes and crevices and within clutter outdoors. Their egg sacs look like fluffy cotton balls and may have 300 eggs inside.
- E. [Cockroaches](#) give off allergens that lead to asthma and can also transmit bacteria that causes food poisoning. The species pictured, the American cockroach, are common outdoor pests and are about two inches long, and their egg cases each contain about 12 young. A female cockroach can produce over 800 cockroaches in one year!
- F. [Green lacewings](#) are beneficial insects often spotted hovering around porch lights at night. Some adults are predaceous, while others feed on honeydew, nectar, and pollen. Their eggs are laid singly on long silken stalks attached to plant tissue, sometimes in small groups.



Harlequin bug. (Photo: Jack Kelly Clark)



Leaffooted bug. (Photo: David R. Haviland)



Tomato hornworm moth. (Photo: Jack Kelly Clark)



Female black widow spider. (Photo: Rick S. Vetter)



American cockroach. (Photo: Jack Kelly Clark)



Green lacewing. (Photo: Jack Kelly Clark)

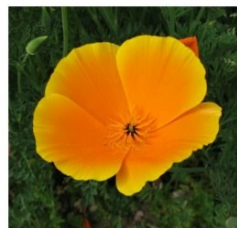
California's State Soil

Marcy Sousa

We all know California has many state symbols. The grizzly bear flying in the state flag, golden poppies and the valley quail are all symbols that connect you back to our golden state. Did you know that California has a state soil?

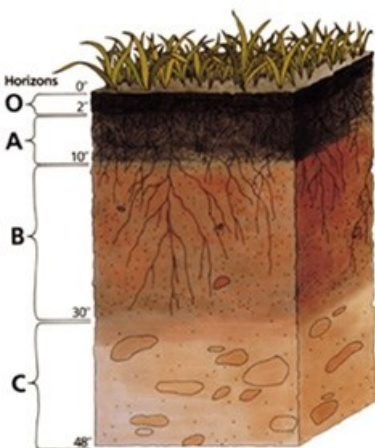
What is a State Soil?

A state soil is a soil that has special significance to a particular state. Each state in the United States has selected a state soil, twenty of which have been legislatively established. These "Official State Soils" share the same level of distinction as official state flowers and birds. Also, representative soils have been selected for Puerto Rico and the Virgin Islands. California's State Soil is the "San Joaquin" soil. The San Joaquin soil was initially documented and officially established in California in 1900 and therefore is the oldest, continuously recognized soil series within the state. It was designated the official state soil of California in 1997.



San Joaquin soil has a distinctive soil horizon (layer) known as a "hardpan" to many people. It is extremely hard and it can be chipped with mechanical means or through use of a pick or very strong, heavy shovel. Typically, San Joaquin soils have a brown to reddish brown surface with a loam texture that has an accumulation of organic matter. It was chosen as the California State Soil because of its interesting soil characteristics, had agricultural significance, had extensive distribution, had a soil name recognizably Californian, and had its typical location in California. California's central valley has more than half a million acres of San Joaquin soils that can be found along the east side of the San Joaquin and lower Sacramento Valleys as a small but important part of this huge California agricultural base.

A little about soil profiles and textures



Soil Horizons: Soil is made up of distinct layers, called horizons. Each layer has its own characteristics that make it different from all of the other layers. These characteristics play a very important role in what the soil is used for and why it is important.

O HORIZON- This is the top layer of soil that is made up of living and decomposed materials like leaves, plants, and bugs. This layer is very thin and is usually pretty dark.

A HORIZON- This is the layer that we call "topsoil" and it is located just below the O Horizon. This layer is made up of minerals and decomposed organic matter and it is also very dark in color. This is the layer that many plants roots grow in.

B HORIZON- This is the layer that we call "subsoil" and it is located just below the A Horizon. This layer has clay and mineral deposits and less organic materials than the layers above it. This layer is also lighter in color than the layers above it.

C HORIZON- This is the layer that we call "regolith" and it is located just below the B Horizon. This layer is made up of slightly unbroken rock and only a little bit of organic material is found here. Plant roots are not found in this layer.

Other California State Symbols



CA State Grass—Purple Needlegrass



CA State Insect—CA Dogface Butterfly



CA State Lichen—Lace Lichen

California's State Soil Continued...

Soil Textures: Three types of particles are found in soil: sand, silt and clay. Soil texture is classified by the type of particle that makes up the majority of the soil. Each soil type has a distinctive textural feel and holding a sample of your garden soil in your hand may help you determine the type of texture that makes up your garden soil.

Sandy Soil: Sand is the largest of the particles found in soil. It is a sharp-edged material, giving the soil a gritty feel. When wet, it remains course and breaks apart easily. Beach sand is at the extreme end of sandy soils. Sandy soil holds almost no nutrients and does not retain moisture. Plants do not grow well in this type of soil.

Silty Soil: Silt particles are smooth and smaller than sand particles. When wet, a silty soil feels mud-like; it's smooth and has a silky texture. It's rich in nutrients but retains moisture to the point where garden plants are unable to access oxygen. In a silty soil, plants wilt because they can't breathe.

Clay Soil: Clay is the smallest of the particles and a clay soil will clump and feel sticky when wet. Air flow between particles is limited if not non-existent. When dry, the soil has a dusty feel to it and the surface is hard and dense, making it difficult to work the soil for tilling or digging. Although high in nutrients, clay soil is less than ideal for gardens. Plant roots may not be able to penetrate the dense soils to access nutrients and oxygen.

Loamy Soil: Loam is a combination of all three particles— sand, silt and clay—in nearly-equal proportions. The large sand particles promote drainage and air flow within the soil. The smaller silt particles are rich in nutrients and aid in moisture retention. Clay, also rich in nutrients, balances the poor soil retention of the sand and the excessive moisture of the silt.

Does your garden have the official state soil? Find out the name of the soil in your landscape by visiting the NRCS's [web soil survey page](#).

What's Wrong Answer—Slime Mold

Slime molds may be slimy, but they are not molds. Molds are fungi, slime mold is classified as belonging to the Kingdom Protista. More than 900 species of slime mold occur all over the world. They feed on [microorganisms](#) that live in any type of dead plant material. They contribute to the decomposition of dead vegetation, and feed on bacteria, yeasts, and fungi.

Slime molds in mulches typically appear in summer after rainfall and are frequently observed when they form large, colorful colonies on the surface of mulch around trees, shrubs, and perennials. Size is variable, ranging from several inches to 2 feet or more in diameter, with an irregular shape. Color is also variable, but the most noticeable form appears as a bright yellow, slimy mass when fresh.

Slime molds will eventually disappear on their own, but their unsightly appearance begs more rapid removal. A forceful spray of water from a garden hose will wash them away.

An Up-close Look at Pollen

Kathy Ikeda



For many people, pollen is the “p-word” . . . as in, “PLEASE, don’t say that word!” The mere mention of pollen can conjure up runny noses, watery and itchy eyes, and looks of desperation from those with hay fever. Here in the fertile, crop-rich San Joaquin Valley, it’s often said that if you don’t already have allergies, you’ll develop them.

Trees such as oaks, birches, conifers (pines, firs, spruces), and nut crops (walnuts, almonds, pecans) are especially prolific producers of pollen, and they’re ubiquitous in our area. They’re joined by other common pollen-producing plants, including grasses and many of our favorite garden flowers. It’s an allergy sufferer’s nightmare.

Pollen literally means “fine flour” or “mill dust” in Latin. While it’s a health nuisance, it’s also a valuable and necessary evil.

We’re familiar with pollen as that yellowish, powdery-looking stuff that drifts away from trees and other plants in spring and summer, making us miserable as it floats through the air, collects on our cars and homes, and settles in our nostrils. But without pollen, we literally couldn’t survive. The vast majority of plants on Earth depend on pollen for their reproduction, and we in turn depend on plants for food and oxygen.

Pollen is unique to seed-producing plants, which are divided into the flowering plants (Angiosperms) and the cone-bearing plants (Gymnosperms). The pollen-bearing structures of these plants are contained either in the flowers or the cones. More primitive plants such as ferns, fungi, mosses, and horsetails don’t make pollen; instead, they produce spores.

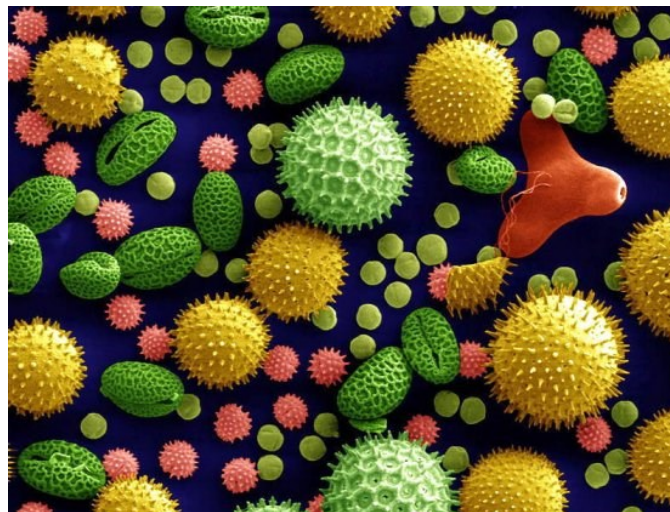
So, what exactly is pollen, anyway?

A clue to pollen’s specific purpose lies in the aforementioned scientific classifications of pollen-producing plants: the suffix –sperm means “seed” in Greek. Pollen is the male vehicle for a seed-forming plant’s sexual reproduction. Each microscopic pollen grain has a hard outer coating that protects the inner contents—two sperm cells and a tube cell—from damage and dehydration.

Plants fall into two categories when it comes to the type of pollination: (1) self-pollinated, or (2) cross-pollinated, where pollen from one plant must transfer to another plant of the same species.

Pollination begins when grains of pollen move from the male part of a plant to the female part of a plant. Pollen transfer can occur in one of two ways: (1) abiotic pollination, where pollen is carried by wind or water (most common in grasses and trees), or (2) the far-more-typical biotic pollination, where a living organism such as a bee, butterfly, moth, wasp, fly, bird, bat, or other animal moves the pollen (most common in non-tree flowering plants).

Once a pollen grain comes in contact with the female part of a plant, it germinates. A pollen tube develops, emerging through a specialized opening in the outer



False-color scanning electron microscope image of pollen grains from a variety of common plants: sunflower, morning glory, prairie hollyhock, oriental lily, evening primrose and castor bean. (Public domain image from the Dartmouth

An Up-close Look at Pollen Continued

covering then extending toward the structure that holds the egg. The sperm cells then leave the pollen grain and travel through the pollen tube, ending their journey when they reach the egg. Fertilization occurs once the plant's egg/ovule and sperm cells unite, and that initiates seed development.

Some amazing pollen-related facts about corn: Just one stalk can produce about 18 million pollen grains! The pollen grains land on the ends of the female corn silk; there is one strand of silk attached to each developing kernel. The single-celled pollen tubes that grow from the pollen grains through the silk can be up to a foot long! Many small members of the animal kingdom depend upon pollen. Honeybees and native bees use protein-rich pollen, either eating it themselves or mixing it with sugary nectar before feeding it to their developing larvae. (Pollen is not used to make honey; honey is regurgitated nectar.) Some beetles—including ladybugs—and many common types of web-weaving spiders also consume pollen as part of their diet.

When seen under a microscope, pollen grains are exquisitely beautiful natural works of art. Their outer coatings are intricately patterned, spiked, or pitted, and different plant species produce their own unique pollen designs. Pollen can be sticky-surfaced or spine-studded so that it's easily carried on the hair, feathers, or fur of pollinators, or it can be lightweight and aerodynamically crafted to float in a breeze.

For more information and a visual treat, read the book [Pollen: The Hidden Sexuality of Flowers](#), or search the Internet for "pollen electron microscopy" to see extraordinary images. And try very hard to appreciate pollen, even as it makes you sneeze.

10 Tips for Attracting Hummingbirds

1. Make your own nectar. 4 parts water to 1 part white sugar should do the trick.
2. Keep your hummingbird feeders clean.
3. Be sure to use an ant moat to keep ants from invading your feeder.
4. If bees and wasps are a problem in your area, get a feeder that will keep them away.
5. Position the feeder near a tree or bush to give the hummingbirds a place to perch and rest.
6. Hummingbirds are attracted to bright colors. Red might be the most common but pink, orange, purple, and blue will also work.
7. Don't use red dye in your feeders. It's at best unnecessary and at worst could be harming the birds.
8. Change your sugar water every 3-5 days, more often if it's very hot outside.
9. Plant brightly colored flowers in order to help hummingbirds find your yard.
10. Be patient—It may take some time for hummingbirds to find your feeder.





BENEFITS OF URBAN TREES



Strategic placement of trees in urban areas can **cool the air** by between 2 °C and 8 °C.



Large urban trees are excellent **filters for urban pollutants** and fine particulates.



Mature trees **regulate water flow** and **improve water quality**.

A tree can absorb up to 150 kg of CO₂ per year, sequester carbon and consequently **mitigate climate change**.



Wood can be used for **cooking and heating**.



Trees can **provide food**, such as fruits, nuts and leaves.

Spending time near trees **improves physical and mental health** by increasing energy level and speed of recovery, while decreasing blood pressure and stress.



Trees properly placed around buildings can **reduce air conditioning needs** by 30% and **save energy used for heating** by 20–50%.



Trees provide habitat, food and protection to plants and animals, **increasing urban biodiversity**.



Landscaping, especially with trees, can **increase property values** by 20%.

World urban population is growing fast...



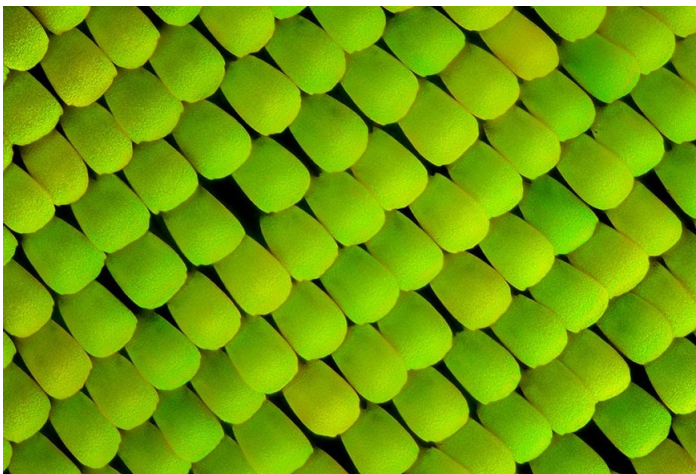
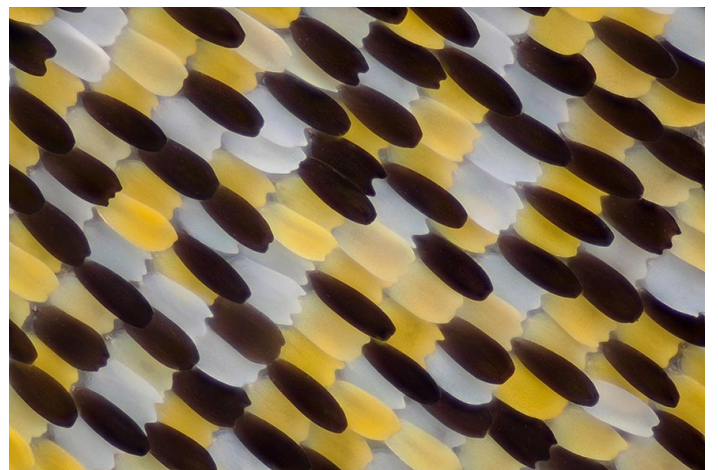
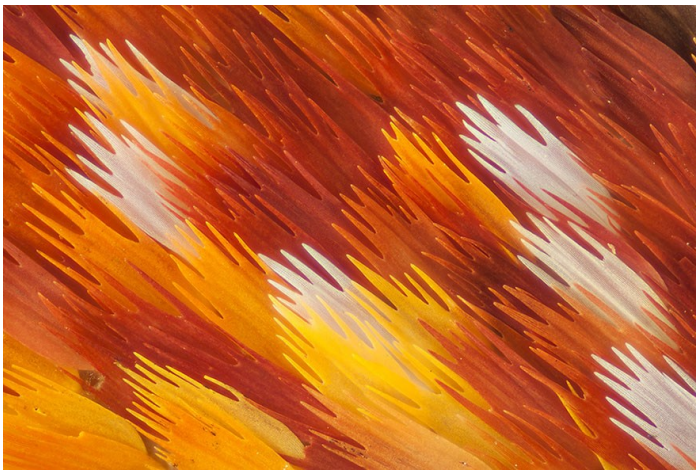
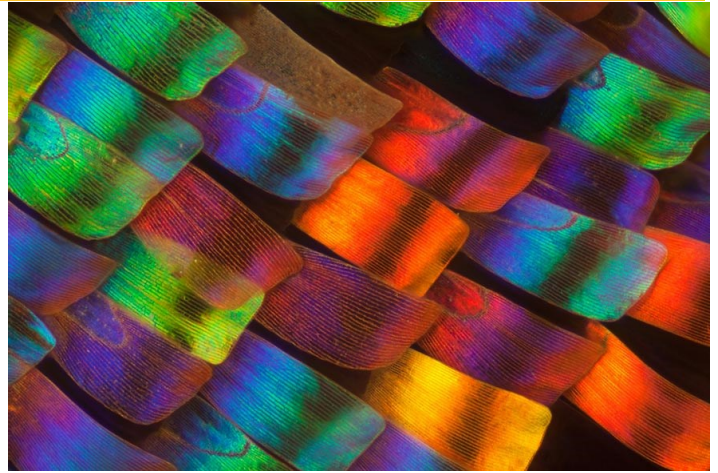
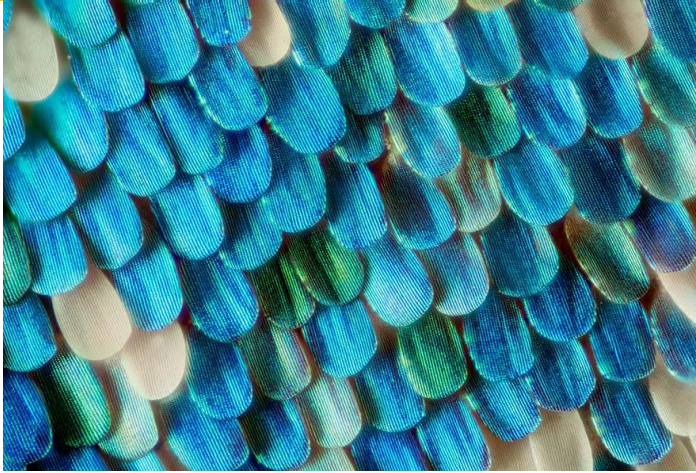
...planting trees today is essential for future generations!



Out and About—Master Gardener's in the Community



Just Because It's Really Cool Butterfly Scales by Linden Gledhill



Linden Gledhill is an artist who explores the physical world at different image scales and fragments of time. His education in science has led to the use of advanced microscopy and high speed equipment to create unexpected imagery revealing the physical beauty which surrounds us. To view more of his images, visit his [Flickr album](#) or [his website](#).



Advise To Grow By



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Pinterest Inspiration—From the Kitchen

